

ST. PAUL'S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF NEONATAL NURSING



**ASSESSMENT OF THE RATE AND ITS ASSOCIATED
FACTORS IN DEVELOPMENT OF BIRTH ASPHYXIA AMONG
NEONATES DELIVERED IN SPHMMC, ADDIS ABABA FROM
APRIL 2016- MARCH 2017.**

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF
NURSING EDUCATION DIRECTORATE, SPHMMC, IN PARTIAL
FULFILLMENT FOR THE BACHELOR OF SCIENCE IN NEONATAL
NURSING SPECIALTY.**

SUBMITTED ON-AUG - 2017

ST.PAUL’S HOSPITAL MILLENNIUM MEDICAL COLLEGE

DEPARTMENT OF NEONATAL NURSING

BACHELOR OF SCIENCE RESEARCH PROJECT SUBMISSION FORM

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FULL TITLE OF THE RESEARCH PROJECT	ASSESSMENT OF THE RATE AND ITS ASSOCIATED FACTORS IN DEVELOPMENT OF BIRTH ASPHYXIA AMONG NEONATES DELIVERED IN SPHMMC, ADDIS ABEBA FROM APRIL 2016-MARCH 2017
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APPROVAL SHEET

ST.PAUL’S HOSPITAL MILLINIUM MEDICAL COLLEGE NURSING EDUCATION DIRECTORATE AND DEPARTMENT OF NEONATAL NURSING

I hereby certify that, I have read and evaluated this research project entitled **“Assessment of the rate and its associated factors in development of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016- March 2017”** by III year Bachelor of Science students in partial fulfillment for the Bachelor of Science in Neonatal Nursing Specialty.

P.JOHN PRABHU M.SC (N)„

ADVISOR

SIGNATURE

DATE

SPHMMC DEPARTMENT OF NEONATAL NURSING
DECLARATION BY THE CANDIDATES

We hereby declare that, this research project entitled “**Assessment of the rate and its associated factors in development of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016- March 2017**” is genuine research work carried out by III year Bachelor of Science students in partial fulfillment for the Bachelor of Science in neonatal nursing specialty.

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ABBREVIATION

ANC - Ante Natal Care

AOR- Adjusted Odd Ratio

CI- Confidence Interval

SD- Standard Deviation

MDG- Millennium Development Goal

NICU- Neonatal Intensive Care Unit

SDG- Sustainable Development Goal

SPHMMC- St. Paul's Hospital Millennium Medical College

SPSS- Software Package for Social Sciences

WHO-World Health Organization

ABSTRACT

Background: Birth asphyxia is a significant contributor to the new born morbidity and mortality as well as long term neurological deficit. It is a significant case of Neuro developmental handicaps in term babies remained a common problem in the developing world

Objective: To assess the rate and its associated factors in development of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016 to March 2017.

Methodology: A one year retrospective cross sectional study design was used ,using non - probability Convenience sampling technique; frequency, proportion, mean and SD was used. After assess the normality of distribution of the data bivariate and multivariate analysis was used to determine the association between different factors and the outcome variable.

Result: From 9738 neonates, 246 asphyxia a rate of approximately 25/1000 live births. The 92(37%) mothers of asphyxiated babies age is 21-25 years old (Mean 2.54, Std. Dev 1.09) and 136 (55.3%) education statuses were illiterate. Regarding the residence of mothers 135(56.1%) was living in rural and 107(43.5%) orthodox by religion. Concerning the Occupation of the mother 164(66.7%) and 40(16.3%) were house wife and privet employee respectively. In binary logistic regression analysis variables such as age of mother, educational level, duration of labor, mode of delivery, time of labor and gestational age of babies were found to be significantly associated with neonatal asphyxia. In multiple logistic regression analysis the following variables were found to have statistically significance association with asphyxia: age of mother, educational level, duration of labor, mode of delivery, and duration of labor showed association.

Conclusion- the rate of asphyxia in St. Paul hospital Millennium Medical college is 25/1000 live birth

Recommendation-further studies needed conduct to minimize the rate of birth asphyxia

CHAPTER ONE

INTRODUCTION

1.1. BACKGROUND INFORMATION

Birth asphyxia is a significant contributor to the new born morbidity and mortality as well as long term neurological deficit. It is a significant cause of neuro developmental handicaps in term babies remained a common problem in the developing world.

High mortality, high fertility and low life expectancy characterize the demography, as in most sub-Saharan African countries. In the past decade, however, the country witnessed an unprecedented decline in under-five mortality from 166 per 1000 in 2000 to 88 per 1000 live births in 2011 (9), an average decline of 47%. Approximately 42% of the under-five mortality in Ethiopia is attributable to neonatal deaths (8). According to the 2011 Ethiopia Demographic and Health Surveys (DHS), the country is experiencing a high neonatal mortality rate at 37 per 1000 live births, comparable to the average rate of 35.9 per 1000 live births for the African region overall [10]. The causes of neonatal mortality are not well documented in Ethiopia, but previous studies report causes such as sepsis, asphyxia, birth injury, tetanus, preterm birth, congenital malformations and unknown causes (7).

Birth asphyxia is estimated to account for 23% of the four million global neonatal deaths and an additional one million stillbirths annually (9, 10).

The burden of asphyxia-related morbidity and mortality is concentrated in low-middle income countries, where 99% of neonatal deaths occur and the majority of births occur without medical supervision (11). The lack of a standardized case definition for birth asphyxia, particularly in community-based settings, is a fundamental challenge to understanding its global public health impact and to identifying and redressing risk factors. (2)The World Health Organization (WHO) defines birth asphyxia as “the failure to initiate and sustain breathing at birth;(12) whereas the American Academy of Pediatrics (13) classifies an asphyxiated infant with: 1) umbilical cord

arterial pH < 7.0, 2) Apgar score of 0-3 at > 5 minutes, 3) neurological manifestations (seizure, coma, or hypotonic) and 4) multi-system organ dysfunction (cardiovascular, gastrointestinal, hematologic, pulmonary, or renal). Apgar scores and acidosis, however, have low sensitivity and low positive predictive value for neurological injury and morbidity (13, 14) Furthermore, laboratory data and monitoring are not feasible in resource-poor regions where the majority of births occur outside of health facilities, without skilled attendants, and many deaths occur before the infant survives long enough to develop neurological signs and organ system dysfunction. Therefore, community level definitions of birth asphyxia must utilize information about an infant's clinical condition surrounding the time of death that can be described by non-medical caretakers (15).

1.2. STATEMENT OF THE PROBLEM

Although there have been dramatic improvements in child survival, the burden of mortality in the first month of life has remained virtually unchanged. An increasing proportion (almost 40 percent) of deaths of children under the age of five occurs during the first 28 days of life. Each year, four million newborns die - three-quarters during the first week - of which at least one million die in their first 24 hours. Most newborn deaths occur at home, in the absence of any contact with a skilled health care provider (16) many of the world's four million stillbirths and 500,000 maternal deaths also occur close to the time of birth. About 99 percent of all newborn deaths occur in low- and middle- income countries, with two-thirds of those occurring in Asia and Africa (17).

The health of the newborn has been neglected despite the huge number of deaths due to various reasons such as: mother's inability to seek skilled care during delivery, unhygienic delivery practices which result in infections of the newborn, bathing baby immediately after delivery, improper cord care, delaying immediate contact between mother and newborn because of the belief that the newborn is dirty and must be cleaned before contact and the fact that most neonatal deaths are unseen and undocumented. Addressing neonatal mortality requires a continuity of care between maternal and child health which is lacking in many settings with care for neonate often receiving little attention in maternal and child health programs. Major causes of newborn deaths include birth asphyxia (21 percent), infections: tetanus, sepsis, meningitis,

pneumonia and diarrhea (42 percent). The birth process was the antecedent cause of 2/3 of deaths as a result of infections; lack of hygiene at child birth and during newborn period and home deliveries without skilled birth attendants. Low birth weight infants and preterm newborns as well as social, cultural and health practices which delay care to the newborn, contribute significantly to neonatal deaths. It is argued that up to 72 percent of these neonatal deaths (almost three million deaths) could be prevented through basic, cost-effective interventions (18) Factors such as low income, poverty, illiteracy, home deliveries, that is lack of skilled care at birth, no health system at the grass roots, dysfunctional distant facilities, low demand for newborn care and harmful traditional practices can be associated with poor newborn health and survival.

Most neonatal deaths can be avoided by measures such as clean delivery, resuscitation, management of infections, thermal protection, breastfeeding, and eye care to reduce blindness, but some of these measures are however, ignored in the Ethiopia. Birth asphyxia is a significant contributor to prenatal morbidity and mortality in Ethiopia a review casus of admission to neonatal intensive care unit birth asphyxia was the second highest cause after prematurity .This study sought to investigate the rate of neonatal asphyxia that influences newborn survival in the St. Paul Hospital Millennium Medical College.

1.3. SIGNIFICANCE OF THE STUDY

This research study on assessment of the rate and associated factors of neonatal mortality among neonate delivered in St. Pual Millennium Medical College.

First the study is requirement of Neonatal BSc nursing degree, the second it may provide some insight about the rate and some related factor about neonatal asphyxia, thirdly information about the condition of neonatal asphyxia for those individuals or groups who are concerned. It may serve as a reference for further studies on the subject matter.

CHAPTER TWO

LITERATURE REVIEW

2.1. REVIEW OF EMPIRICAL LITERATURE

Polite and beck (2003) defined that “a literature review involves systematic identification, location, scrutiny and summary of written material that contains information on research problems”.

This chapter deals with a review of published and unpublished research studies and related material for the present study. The review helped the researcher to develop an insight into the problem area and helped to build the foundation of the study.

Intrapartum asphyxia responsible for an estimated 814,000 neonatal deaths and also one million still birth each year with estimated one million disabled survivors with long term intellectual impairment and behavioral problems.(48)

Birth asphyxia is said to contribute 3-13% of cerebral palsy in developed countries .In one study done in the USA, the incidence of Intrapartum asphyxia was 2.3% and a significant proportion of intrapartum asphyxia occurred in pregnancies with risk factors.(49)

In a Western Australian case control study of antepartum risk factors for newborn encephalopathy, the prevalence of severe or moderate encephalopathy in term babies was 3.18/1000 with a neonatal case fatality of 9.0% and the risk increased with advanced maternal age and parity, unemployment and housewives.(49)

Another study that examined the reasons for admission, causes of death and cost of admission to a tertiary neonatal unit in India noted that the main causes of death were asphyxia,

The incidence of Birth asphyxia varies widely because of different definitions used. However, highest incidence rates are found in developing countries like Nigerian 26/1000, Libya 28/1000, and the lowest incidences are found in developed countries which range between 2.5 to 9.0/1000(1). In Central Africa, one study found the incidence to be 22% .(49)

In Ethiopia, due to the absence of vital event registration, most deaths are left undocumented. As the vast majority of deaths occur outside the health system, the ability of health facilities to generate representative statistics is limited in the country [39]. In this regard, the use of verbal autopsy (VA) from health and demographic surveillance system is the most promising interim solution for this problem [40–41].

In northern Ethiopia study identified the leading causes of death to be prematurity [23 (34%)], and asphyxia [21 (31%)] which accounted for 2 of every 3 deaths (44)

Another study conducted in Amhara region West Gojam shows that the leading causes of perinatal death were infection, birth asphyxia, ante partum hemorrhage, hypertensive disorders of pregnancy and obstructed labor. The high prevalence of causes like asphyxia, obstructed labor and infections indicates the limited access to skilled delivery care. In the study area, more than ninety percent of the births took place at home. The extended time the mother spends with obstructed labor before going to health facilities, while attempting home delivery, predisposes the baby to distress leading to asphyxia. (42)

When we come to Addis Ababa shows in Tukur anbessa Hospital the most common of neonatal deaths where intrapartum related birth asphyxia (27.8%). (48)

Recent study shows in SPMMC the leading cause of neonatal mortality birth asphyxia 28% next to prematurity. (50)

Reducing under five mortality rate by two third was Millennium Development Goal number 5 (MDG-5) that ends in 2015 and Ethiopia is one of the countries achieved this goal. However, the rates disaggregated by age showed that neonatal mortality continues to be suspended high with little or no sign of reduction over years [32, 45]. Focusing on under-five mortality in general and neonatal mortality in particular continues to be the focus during Sustainable Development Goal (SDG) period [46]. Consistent to the SDG goals, Ethiopia has also developed a health sector strategic plan to direct its health intervention through 2035. In this plan, the country aspires to be a middle income country averting unnecessary neonatal mortality [47]. Therefore, it is

imperative to substantiate with findings on the ground if the country is in the right direction over the years bench marking the end period of MDG.

2.2. CONCEPTUAL FRAMEWORK

The figure below shows the effect of independent variables on the outcome variable of neonatal asphyxia. These variables directly and indirectly will have impact on birth asphyxia.

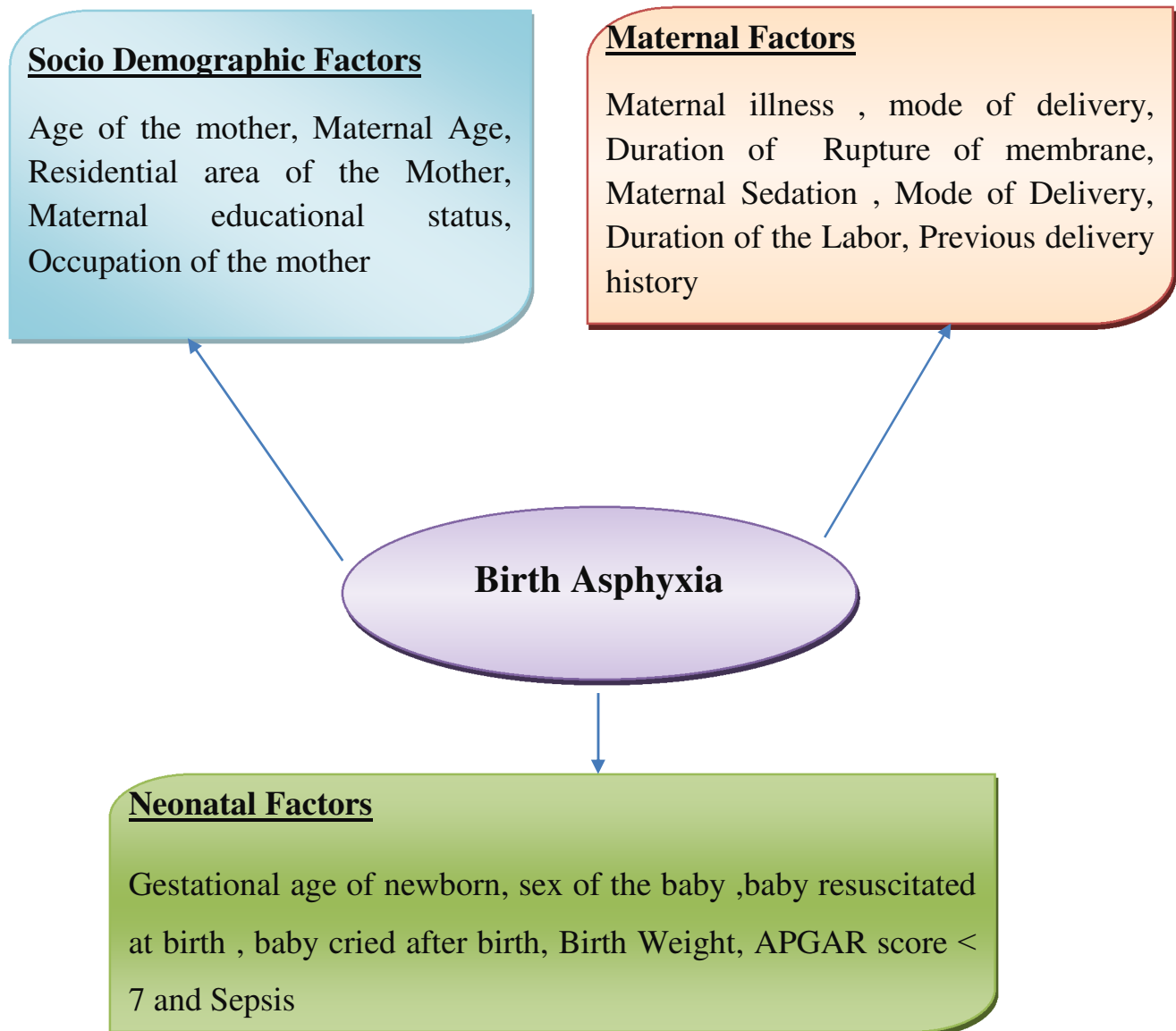


Figure-1: Conceptual Framework of factors associated with birth asphyxia.

CHAPTER THREE

OBJECTIVES

3.1. GENERAL OBJECTIVE

To assess the rate and its associated factors in development of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016 to March 2017.

3.2. SPECIFIC OBJECTIVES

- ✓ To assess the rate of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016 to March 2017.
- ✓ To identify the associated factors of birth asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016 to March 2017.

CHAPTER FOUR

METHODOLOGY

4.1. STUDY AREA

Ethiopia is a country located in the horn of Africa. It shares border with Eritrea to the north and northeast Djibouti and Somalia to the east Sudan and south Sudan to the west and Kenya to the south, with nearly 100million inhabitants. Addis Ababa is the capital city. There are about four Federal Hospital under Federal Ministry of health in Addis Ababa. St. Paul's Hospital Millennium Medical College is one of them. This hospital has total of eight labor couch and two cesarean tables overall and NICU has 13 beds, eight incubators and nine radiant warmers. NICU is 30 meters away from the labor and delivery unit, where newborn are admitted from different hospitals and health centers. This unit has senior neonatologist, pediatrician, interns and nurses. SPHMMC specialized referral hospital offers diagnostic and treatment for approximately 300,000 to 400,000 patients per year.

4.2. STUDY DESIGN

A one year Retrospective Cross-sectional design was used to review the patient's charts and registry books at NICU of SPHMMC, Addis Ababa from April 2016-March 2017.

4.3. STUDY POPULATION

The study population was Neonates with birth asphyxia, who were delivered in SPHMMC , Addis Ababa from April 2016- March2017.

4.4. STUDY VARIABLES

4.4.1. INDEPENDENT VARIABLES:

1) Socio demographic data-Age of the mother, Educational status, Place of residence, Religion of mother, Occupation of the mother.

2) Maternal and newborn related factors -Mode of delivery, Duration of labour, Duration of rupture of membrane, Maternal illness, Mother previous medical history, ANC follow up, Gestational age of newborn, Birth weight of newborn, Gender of the baby.

3) Clinical pictures-APGAR score, Resuscitation at birth, cried at birth

4.4.2. DEPENDENT VARIABLE: Birth Asphyxia

4.5. INCLUSIVE CRITERIA

All Neonates Who Were Delivered and Developed Birth Asphyxia in SPHMMC, Addis Ababa from April 2016- March 2017 were included for the Study.

4.6. EXCLUSIVE CRITERIA

Neonates whose Chart was Incomplete and Neonates delivered in other institution were excluded from this Study.

4.7. SAMPLING TECHNIQUE

Non –probability Convenient Sampling Method was used to select the study Subjects who met the Inclusion Criteria.

4.8. DATA COLLECTION METHOD AND TECHNIQUE

The Secondary Data was collected from Hospital Patient Registration Books and Patient Charts. A structured check list was prepared by the Principal Investigators which was used for collecting Data. Neonates who developed Birth Asphyxia were Being Hand-picked from the Delivery Log books of the Hospital. This involves going through log book records of neonates with the diagnosis of birth asphyxia April'2016 to March'2017. Associated factors were identified from medical Log books of baby with the diagnosis of birth asphyxia. If there is incomplete maternal information on the neonatal card, the maternal card was traced by using card number.

4.9. QUALITY CONTROL FOR THE RESEARCH

The quality of data will be controlled starting from the time of check list preparation. The collected data will be cleaned checked and cross checked for its completeness and internal consistency by the data collectors followed by data entry.

4.10. DATA MANAGEMENT

Check list was filled by reviewing patient charts. Check list were checked for its completeness, missing items and consistency. Accordingly, corrections were made on the spot. Each check list was numbered. Record reviews were rechecked for errors in compilation.

4.11. DATA ANALYSIS PROCEDURE

The data was cleaned for inconsistencies and missing values and amendment was considered as needed, coded and entered in to SPSSV 16 version for analysis, frequency, proportion, mean and SD was used. After assess the normality of distribution of the data bivariate and multivariate analysis was used to determine the association between different factors and the outcome variable.

A bivariate logistic regression was used to identify patient variables for final model (multiple logistic regression) at P-value <0.02. Finally the independent variables which had significant association were identified by using multiple logistic regressions. The cut point to declare the presence of association between dependent and independent variable was P- value< 0.05 or AOR, 95% CI.

4.12. OPERATIONAL DEFINITION

- 1. ASSESSMENT-** It refers to evaluate the ideas about Neonatal Asphyxia.
- 2. RATE –** is the total number of cases of a disease exist in a population divided by the total population.
- 3. NEONATE -** A human infant from the time of birth through the 28 day of life.
- 4. BIRTH ASPHYXIA –** It refers to the Medical condition resulting from deprivation of oxygen to a new born infant that lasts long enough during the birth process to cause physical harm usually to the brain.
- 5. APGAR SCORE –** It is a tool to measure the physical condition of newborn infant. It is obtained by adding points (2, 1 or 0) for heart rate, respiratory effort, muscle tone, response of stimulation and skin coloration .a score of ten represents the best possible condition.

4.13. ETHICAL CONSIDERATION

Before data collection, ethical clearance was obtained from the Research Ethics Committee SPHMMC Addis Ababa. Permission was obtained from medical directors and head nurses of respective departments. After data collection confidentiality of information was maintained as per the norm of the hospital.

4.14. DISSEMINATION OF RESULTS:

Results of this study will be presented and communicated to the SPHMMC, Nursing Educational directorate and other concerned bodies through presentation of soft and hard copies. Efforts will be made to present the results on international and national conferences and peer reviewed journal publications will also have considered.

CHAPTER FIVE

RESULTS

SECTION -A

From the nine thousand seven hundred thirty eight neonates delivered to St. Paul hospital millennium medical college, two hundred forty six had asphyxia, giving a rate of approximately twenty five per one thousand live births (25/1000). The 92(37%) mothers of asphyxiated babies age is 21-25 years old (Mean 2.54, Std. Dev 1.09) and 136 (55.3%) education statuses were illiterate. Regarding the residence of mothers 135(56.1%) was living in rural and 107(43.5%) orthodox by religion. Concerning the Occupation of the mother 164(66.7%) and 40(16.3%) were house wife and privet employee respectively (Table 1).

Table1. Frequency and percentage distribution of socio demographic variable of mother who delivered new born with birth asphyxia at St. Paul Hospital Millennium Medical collage from April 2016 to March 2017.

Sr. No	Variable	Frequency	Percentage
1	Age of mother		
	15-20 years old	40	16%
	21-25 years old	92	38%
	26-30 years old	69	28%
	31-35 years old	30	12%
	36-40 years old	15	6%
	Total	246	100.0
2	Maternal educational status		
	Illiterate	136	55.3
	Primary	64	26.0
	Secondary	30	12.2
	Higher education	16	6.5
	Total	246	100.0
3	Residential area of mother		
	Rural	138	56.1
	Urban	108	43.9
	Total	246	100.0
4	Religion of the mother		

	Orthodox	107	43.5
	Muslim	71	28.9
	Protestant	34	13.8
	Catholic	27	11.0
	Other	7	2.8
	Total	246	100.0
5	Occupation of the mother		
	house wife	164	66.7
	Private	40	16.3
	Government	18	7.3
	Other	24	9.8
	Total	246	100.0

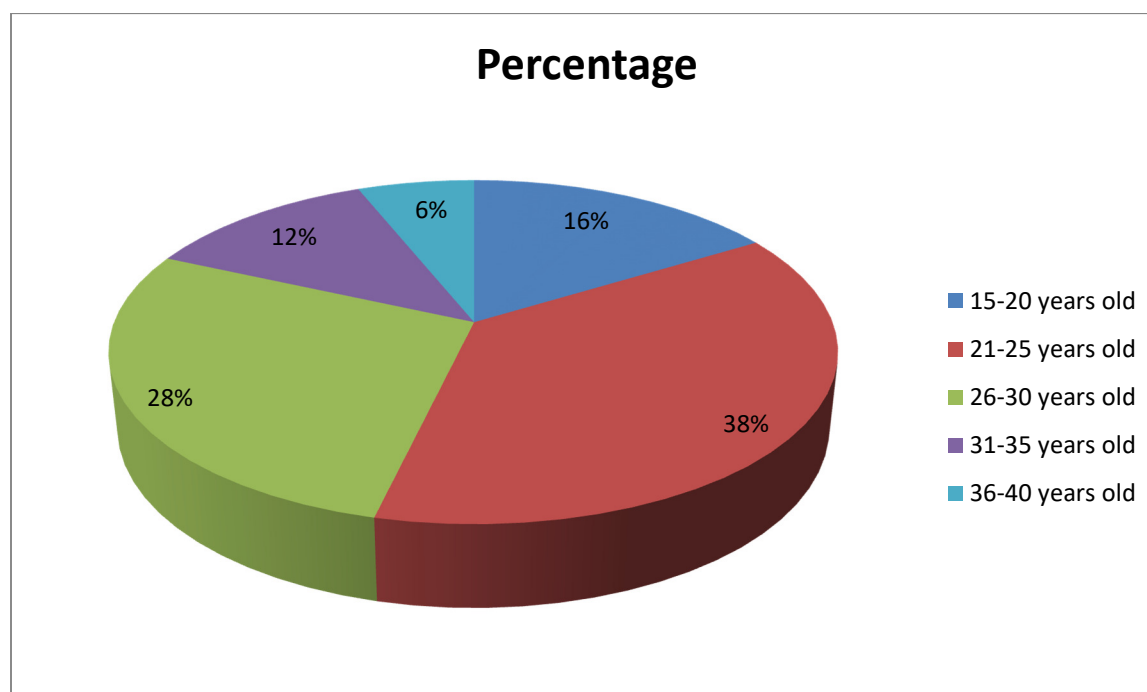


Figure 2: Percentage distribution based on age of the mother

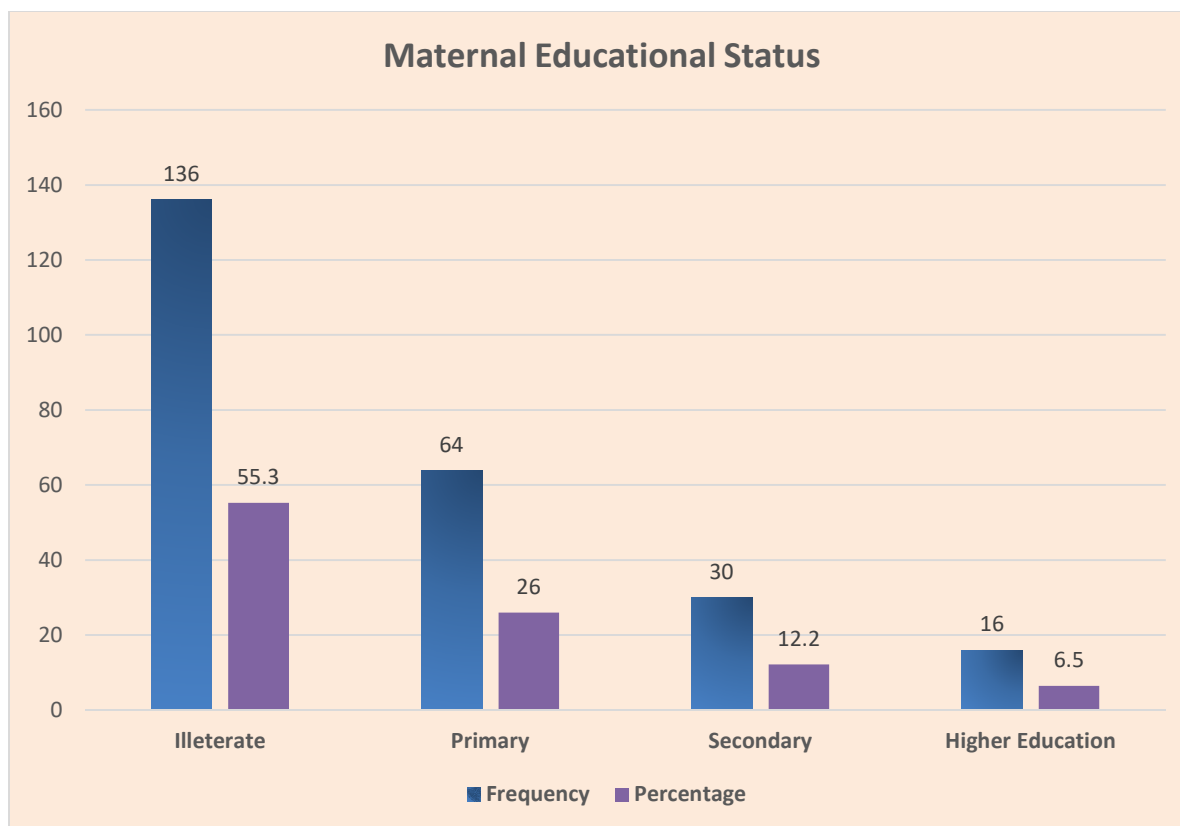


Figure 3: Percentage distribution based on maternal educational status

Section B

Delivery after labour of 6 to 18 hours was experienced by 206 (83%) women while 40 (16 %) delivered greater than 18 hrs of initiation of labour. During the rupture of member 129(52.4%) was intra partum rupture of membrane and 117(47.6%) premature rapture of membrane.

According to this study maternal antenatal follow-up 209(85%) have follow-up and 37 (15%) didn't attended and 24(9.8%) of them had hypertension history. Instated of previous delivery history of mothers 12(4.9%) premature birth, 12(4.9%) neonatal death, 11(4.5%) intra uterine death and 20(8.1%) have abortion.

Table 2 Frequency and percentage distribution of maternal and new born associated factor of birth asphyxia among new born delivered in St. Paul Hospital Millennium Medical collage from April 2016 to March 2017

Sr. No	Variable	Frequency	Percentage
1	Mode of delivery		
	spontaneous vaginal delivery	177	72.0
	vacuum delivery	19	7.7
	forceps delivery	8	3.3
	cesarean section	42	17.1
	Total	246	100.0
2	Duration of labor		
	6 to 18 hours	206	83.7
	>18	40	16.3
	Total	246	100.0
3	Duration of rupture of membrane		
	premature rapture of membrane	117	47.6
	intra partum rupture of membrane	129	52.4
	Total	246	100.0
4	Maternal illness		
	Hypertension	24	9.8
	diabetes mellitus	6	2.4
	no medical illness	206	83.7
	Other	10	4.1
	Total	246	100.0
5	Mother previous delivery history		
	premature birth	12	4.9
	neonatal death	12	4.9
	intra uterine death	11	4.5
	Abortion	20	8.1
	no bad labor history	191	77.6
	Total	246	100.0
6	Ante natal follow up		
	No	37	15.0

	Yes	209	85.0
	Total	246	100.0
7	Gestational age of the new born		
	37 weeks above	210	85.4
	32-37 weeks	33	13.4
	28-32 weeks	3	1.2
	Total	246	100.0
8	Birth weight of the newborn		
	less than 1000 Gram	1	.4
	1000 Gram to 1499 gram	9	3.7
	1500 gram to 2499 gram	34	13.8
	2500 gram to 3999 gram	200	81.3
	4000 gram and above gram	2	.8
	Total	246	100.0
9	Sex of the baby		
	Male	153	62.2
	Female	93	37.8
	Total	246	100.0

Mode of delivery of asphyxiated babies 177(72%) spontaneous vaginal delivery, 42(17.1%) of Delivery of asphyxiated babies 177(72%) spontaneous vaginal delivery, 42(17.1%) cesarean Section, 19(7.7%) and 8(3.3%) forceps delivery.

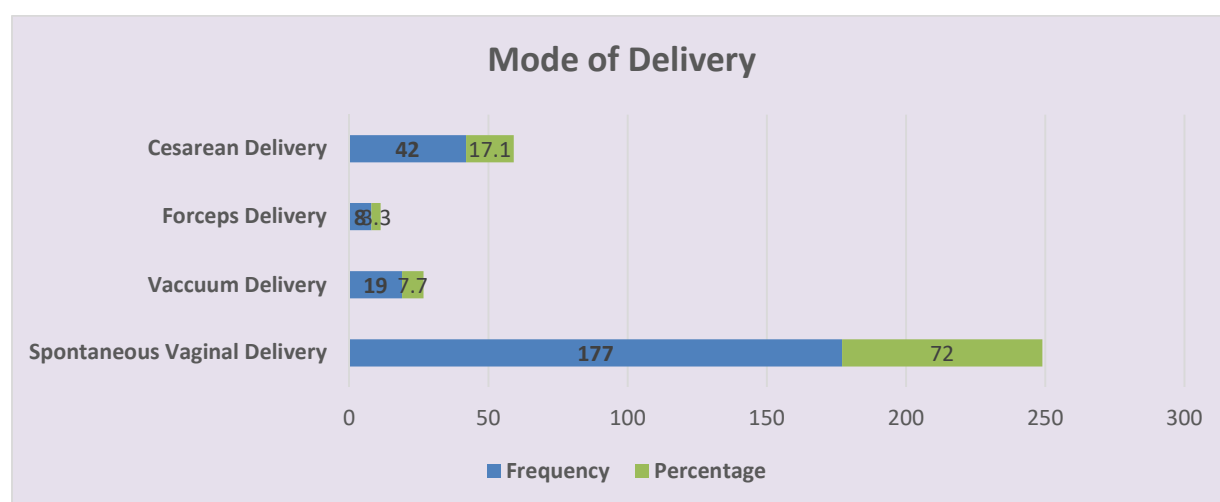


Figure 4 Percentage distribution based on mode of delivery

Rupture of membrane of asphyxiated babies 47.6 % intra partum and 52.4% premature rupture of membrane.

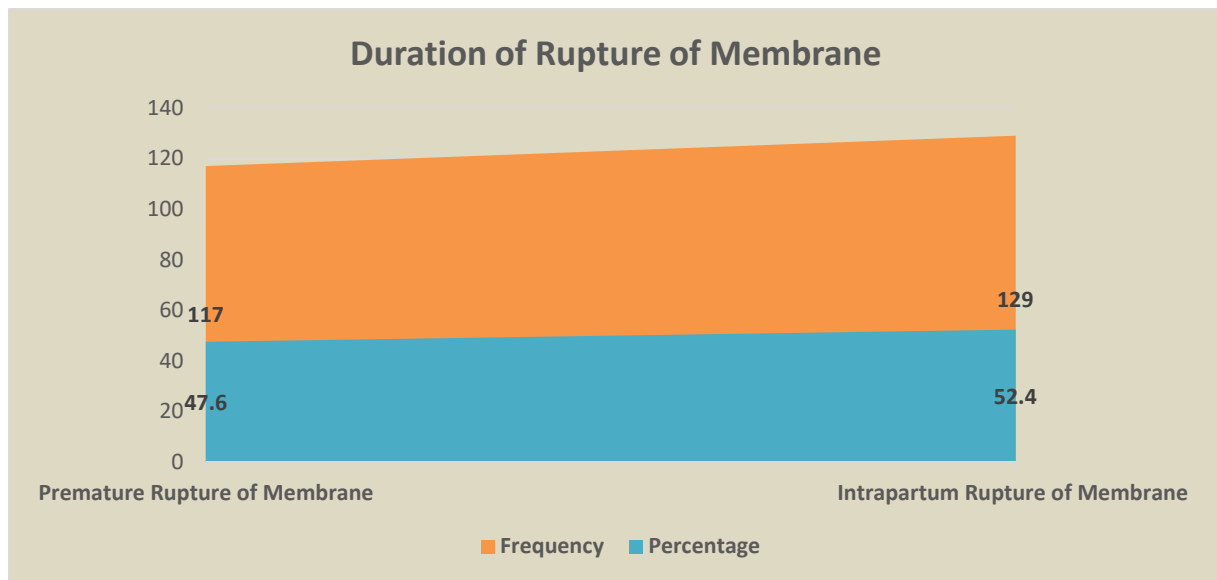


Figure 5: percentage distribution based on duration of rupture of membrane

Regarding of the asphyxiated babies weight 200(81.3%) 2500 to 3999 gram, 34(13.4%) 1500 gram to 2499 gram , 9(3.7%) 1000 gram to 1499 gram. From the asphyxiated babies the 153 (62.5%) male and 93(37.8%) were females. Gestational age of the new born 210(85.4%) of them 37 weeks above, 33(13.4%) 32-37 weeks and 3(1.2%) 28-32 weeks (table 2)

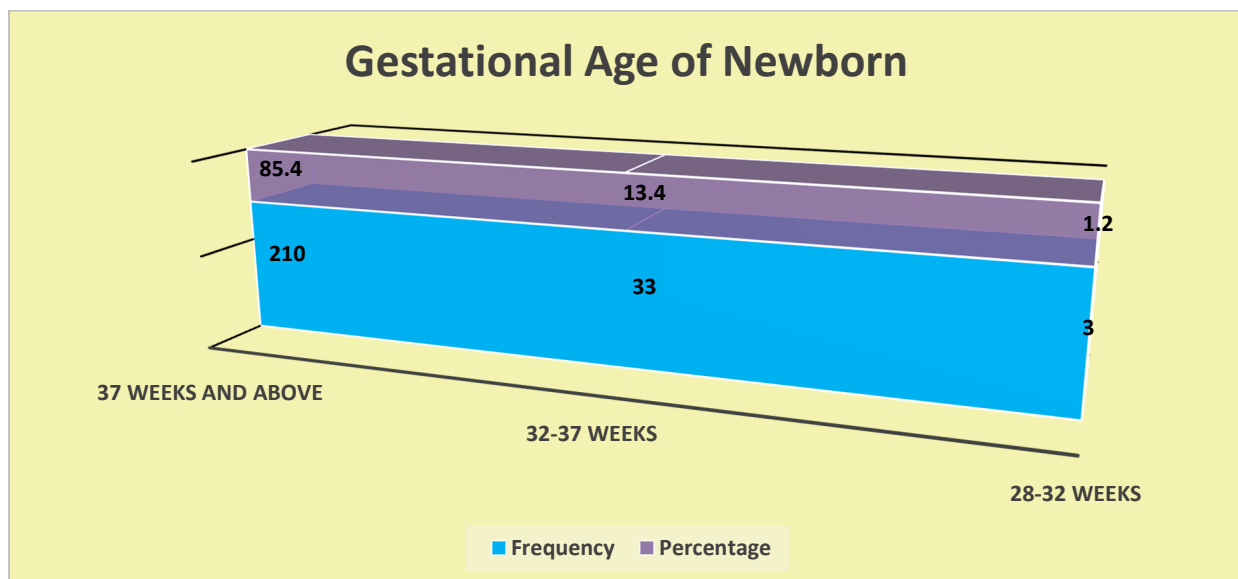


Figure 6: percentage distribution based on Gestational age of new born

SECTION C

APGAR score of the babies was 174(70.7%) 4- 6, 52(21.1%) 7 - 10 and 20(8.1%) 0-3 scores. 199(80.6%) of babies resuscitated and 219(89%) cried after birth (table 3).

TABLE 3

Frequency and percentage distribution of clinical picture of birth asphyxia among new born delivered in St. Paul Hospital Millennium Medical collage from April 2016 to March 2017.

1	APGAR score		
	0-3 scores	20	8.1
	4- 6 scores	174	70.7
	7 - 10 scores	52	21.1
	Total	246	100.0
2	Baby resuscitated at birth		
	No	47	19.1
	Yes	199	80.9
	Total	246	100.0
3	Did baby cried after birth		
	No	27	11.0
	Yes	219	89.0
	Total	246	100.0

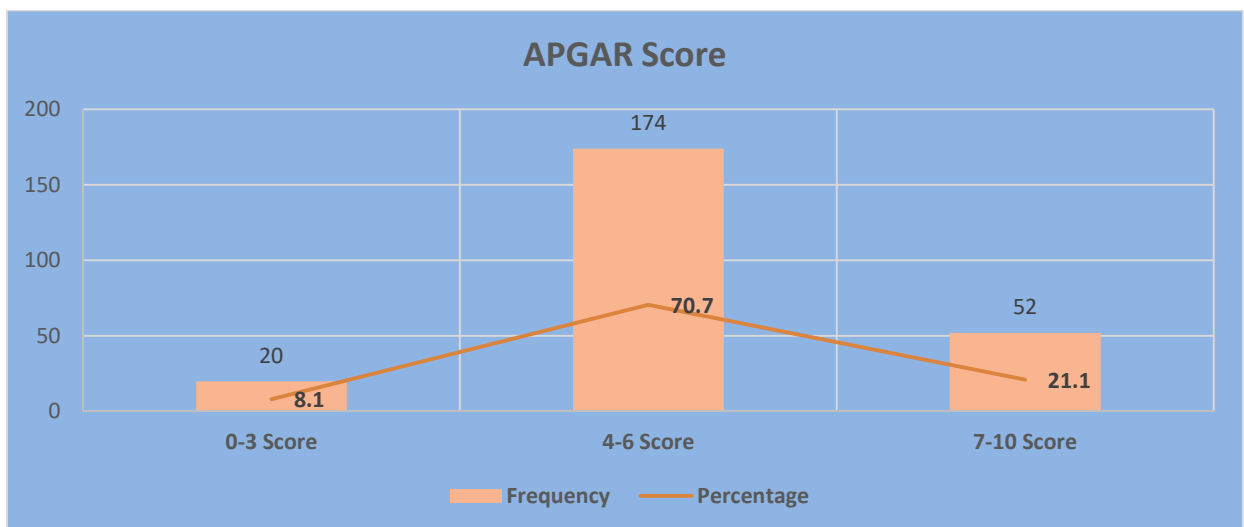


Figure 7 percentage distribution based on Apgar score FACTORS

SECTION- D

ASSOCIATION BETWEEN BIRTH ASPHYXIA AND ITS RELATED FACTORS AMONG NEONATES DELIVERED IN SPHMMC FROM APRIL 2016-MARCH 2017

In binary logistic regression analysis variables such as age of mother, educational level, duration of labor, mode of delivery, time of labor and gestational age of babies were found to be significantly associated with neonatal asphyxia. In multiple logistic regression analysis the following variables were found to have statistically significance association with asphyxia: age of mother, educational level, duration of labor, mode of delivery, and duration of labor showed association.

Table 4: Bivariate Binary Logistic Regression showing the association between birth asphyxia and other associated factors among neonates delivered in SPHMMC from April 2016 to March 2017.

Sr. No	Variable	Frequency	COR CI (95%)	P-value
1	Age of mother			
	15-20 years old	40(16.3%)	0.03(0.01-0.09)*	0.01
	21-25 years old	92(37.4%)	0.01(.040-0.071)*	0.03
	26-30 years old	69(28.0%)	1.173(0.223-6.177)	0.851
	31-35 years old	30(12.2%)	0.359(.067-1.928)	0.232
	36-40 years old	15(6.1%)	1	
	Total	246(100.0%)		
2	Maternal educational status			
	Illiterate	136(55.3)	0.05(0.024-0.037)*	0.09
	Primary	64(26.0)	0.03(.063-0.24)*	0.043
	Secondary	30(12.2)	0.068 (.905-16.798)	3.900
	Higher education	16(6.5)	1	
	Total	246(100.0)		
3	Residential area of mother			
	Rural	138(56.1)	0.979(0.513-1.869)	0.949
	Urban	108(43.9)	1	
	Total	246(100.0)		

4	Religion of the mother			
	Orthodox	107(43.5)	0.683(0.78-5.978)	0.730
	Muslim	71(28.9)	0.622(.069 -5.573)	0.671
	Protestant	34(13.8)	0.778(-7.706)	0.830
	Catholic	27(11.0)	1.333(-15.199)	0.817
	Other	7(2.8)	1	
	Total	246(100.0)		
5	Occupation of the mother			
	house wife	164(66.7)	1.430(0.524-3.900)	0.485
	Private	40(16.3)	2.333(.626-8.699)	0.207
	Government	18(7.3)	1.167(0.275-4.949)	0.834
	Other	24(9.8)	1	
	Total	246(100.0)		

Sr. No	Variable	Frequency	COR(CI 95%)	P value
1	Mode of deliver			
	spontaneous vaginal delivery	177(72.0%)	1.236 (0.539-2.836)	0.617
	vacuum delivery	19(7.7%)	0.023 (0.071-0.054)*	0.04
	forceps delivery	8(3.3%)	0.03 (0.04-0.09)*	0.02
	cesarean section	42(17.1%)	1	
	Total	246(100.0%)		
2	Duration of labor			
	6 to 18 hours	206(83.7%)	0.05 (0.212- 0.9)*	0.027
	>18	40(16.3%)	1	
	Total	246(100.0%)		
3	Duration of rupture of membrane			
	premature rupture of membrane	117(47.6%)	0.576 (0.301-1.103)	.096
	intra partum rupture of membrane	129(52.4%)	1	
	Total	246(100.0%)		
4	Maternal illness			
	Hypertension	24(9.8%)	3.000 (0.489-18.415)	0.235
	diabetes mellitus	6(2.4%)	(0.000)	0.999
	no medical illness	206(83.7%)	1.779 (0.440-7.183)	0.419
	Other	10(4.1%)		
	Total	246(100.0%)		

5	Mother previous delivery history			
	premature birth	12(4.9%)	(0.000)	0.999
	neonatal death	12(4.9%)	3.101 (0.389-24.709)	0.285
	intra uterine death	11(4.5%)	0.752 (0.191-2.959)	0.683
	Abortion	20(8.1%)	(0.000)	0.998
	no bad labor history	191(77.6%)	1	
	Total	246(100.0%)		
6	Ante natal follow up			
	No	37(15.0%)	1.223 (0.478-3.129)	0.675
	Yes	209(85.0%)	1	
	Total	246(100.0%)		
7	Gestational age of the new born			
	37 weeks above	210(85.4%)	2.125 (0.188-24.018)	0.542
	32-37 weeks	33(13.4%)	0.800 (0.212-0.933)*	0.034
	28-32 weeks	3(1.2%)	1	
	Total	246(100.0%)		
8	Birth weight of the newborn			
	less than 1000 Gram	1(0.4%)	(0.000)	1.000
	1000 Gram to 1499 gram	9(3.7%)	(0.090-44.350)	0.661
	1500 gram to 2499 gram	34(13.8%)	(0.507-210.586)	0.129
	2500 gram to 3999 gram	200(81.3%)	(0.261-69.703)	0.309
	4000 gram and above gram	2(0.8%)	1	
	Total	246(100.0%)		
9	Sex of the baby			
	Male	153(62.2%)	(0.384-1.492)	0.421
	Female	93(37.8%)	1	
	Total	246(100.0%)		

10	APGAR score	Frequency	COR (CI 95%)	P value
	0-3 scores	20(8.1%)	0.363 (0.105-1.260)	0.110
	4- 6 scores	174(70.7%)	0.665 (0.275-1.605)	0.364
	7 - 10 scores	52(21.1%)	1	
	Total	246(100.0%)		
11	Baby resuscitated at birth			
	No	47(19.1%)	1.151 (0.497-2.662)	0.743
	Yes	199(80.9%)	1	

	Total	246(100.0%)		
12	Did baby cried after birth			
	No	27(11.0%)	0.499 (0.203-1.223)	0.128
	Yes	219(89.0%)	1	
	Total	246(100.0%)		

P < 0.05

* Significant

MULTIPLE LOGISTIC REGRESSIONS

Neonate who develops birth asphyxia were four times mothers age group 15-20 years old [AOR= 0.04, 95% CI ((0.03-0.07))] and 21-25 years old two times AOR= 0.02, 95% CI (0.050-0.091) compared to 26-30 years old. Similarly, those whose mother educational statuses were illiterate almost eight times more likely develops birth asphyxia [AOR= 0.08 (0.035-0.049), 95% CI (0.1.355-4.044)] and primary education AOR= 0.04, 95% CI (.023-0.043) compared with those mothers learn secondary and higher education. Those neonate who were delivered by vacuum four times AOR= 0.042, 95% CI (0.082-0.043) and forceps delivery were five times develops birth asphyxia AOR=0.05, 95% CI (0.06-0.09) compared to cesarean section and spontaneous vaginal delivery. Duration of labor was found to be [AOR= 0.017 (0.012- 0.9)] two times more likely develops birth asphyxia.

Table 5. Multivariate analysis showing the association between birth asphyxia and other associated factors among neonates delivered in SPHMMC from April 2016- March 2017

Sr. No	Variable	Frequency	COR CI (95%)	AOR	P-value
1	Age of mother				
	15-20 years old	40(16.3%)	0.03(0.01-0.09)	0.04(0.03-0.07)**	0.04*
	21-25 years old	92(37.4%)	0.01(.040-0.071)	0.02(.050-0.091)**	0.03*
	26-30 years old	69(28.0%)	1.173(0.223-6.177)	2.283(0.323-5.265)	0.851
	31-35 years old	30(12.2%)	0.359(.067-1.928)	0.448(.089-3.737)	0.232
	36-40 years old	15(6.1%)	1		
	Total	246(100.0%)			
2	Maternal educational status				
	Illiterate	136(55.3)	0.05(0.024-0.037)*	0.08(0.035-0.049)**	0.07
	Primary	64(26.0)	0.03(.063-0.24)*	0.04(.023-0.043)**	0.033

	Secondary	30(12.2)	0.068 (0.905-16.798)	0.077 (0.105-13.79)	3.900
	Higher education	16(6.5)	1		
	Total	246(100.0)			
3	Mode of deliver				
	spontaneous vaginal delivery	177(72.0%)	1.236 (0.539-2.836)	2.325 (0.347-3.747)	0.017
	vacuum delivery	19(7.7%)	0.023 (0.071-0.054)*	0.042 (0.082-0.043)**	0.03
	forceps delivery	8(3.3%)	0.03 (0.04-0.09)*	0.05 (0.06-0.09)**	0.04
	cesarean section	42(17.1%)	1		
	Total	246(100.0%)			
4	Duration of labor				
	6 to 18 hours	206(83.7%)	0.05 (0.212- 0.9)*	0.017 (0.012- 0.9)*	0.007
	>18	40(16.3%)	1		
	Total	246(100.0%)			

P < 0.05

* Significant

Ajusted odd ratio (AOR)- when we have more variables in the analysis ,we get Adjusted Odds Ratio (AOR) which takes into account the effect due to all the additional variables included in the analysis

CHAPTER SIX

DISCUSSION

The World Health Organization (WHO) estimates that 3% of approximately 120 million infants born in developing countries develop birth asphyxia (12). According to our study, the rate of neonatal asphyxia was 25/1000 live births in past 12 month at St. Paul Hospital millennium Medical college. Birth asphyxia remains a leading cause of neonatal morbidity and mortality in Ethiopia and which is similar to these study. In the past two to three decades, neonatal mortality rates have shown a slow decline in developing countries whereas Infant and under-five mortality rates have declined significantly (1, 3-6).

Birth asphyxia is estimated to account for 23% of the four million global neonatal deaths and an additional one million still births annually (9, 10). The rate of neonatal asphyxia at St. Paul hospital millennium medical colleges 25/1000 is lower than study done at Nigeria 28/1000(34). This shows that effectiveness of policy on maternal and neonatal health policy in Ethiopia. High mortality, high fertility and low life expectancy characterize the demography, as in most sub-Saharan African countries. In the past decade, however, the country witnessed an unprecedented decline in under-five mortality from 166 per 1000 in 2000 to 88 per 1000 live births in 2011 (9), an average decline of 47%. Approximately 42% of the under-five mortality in Ethiopia is attributable to neonatal deaths (8).

From the nine thousand seven hundred thirty eight neonates delivered to St. Paul hospital millennium medical college, two hundred forty six had asphyxia, giving a rate of approximately twenty five per one thousand live births (25/1000). The 92(37%) mothers of asphyxiated babies age is 21-25 years old (Mean 2.54, Std. Dev 1.09) and 136 (55.3%) education statuses were illiterate. Regarding the residence of mothers 135(56.1%) was living in rural and 107(43.5%) orthodox by religion. Concerning the Occupation of the mother 164(66.7%) and 40(16.3%) were house wife and privet employee respectively. In binary logistic regression analysis variables such as age of mother, educational level, duration of labor, mode of delivery, time of labor and gestational age of babies were found to be significantly associated with neonatal asphyxia. In multiple logistic regression analysis the following variables were found to have statistically

significance association with asphyxia: age of mother, educational level, duration of labor, mode of delivery, and duration of labor showed association. In multiple logistic regression Neonate who develops birth asphyxia were four times mothers age group 15-20 years old [AOR= 0.04, 95% CI ((0.03-0.07))] and 21-25 years old two times AOR= 0.02, 95% CI (0.050-0.091) compared to 26-30 years old. Similarly, those whose mother educational statuses were illiterate almost eight times more likely develops birth asphyxia [AOR= 0.08 (0.035-0.049), 95% CI (0.1.355-4.044)] and primary education AOR= 0.04, 95% CI (.023-0.043) compared with those mothers learn secondary and higher education. Those neonate who were delivered by vacuum four times AOR= 0.042, 95% CI (0.082-0.043) and forceps delivery were five times develops birth asphyxia AOR=0.05, 95% CI (0.06-0.09) compared to cesarean section and spontaneous vaginal delivery. Duration of labor was found to be [AOR= 0.017 (0.012- 0.9)] two times more likely develops birth asphyxia.

In neonates lives maternal health is often believed as a vital aspect and it is influenced by health of neonate, this has positive effect on the prevalence of neonatal asphyxia. The finding of this study showed that 15 % of mothers didn't have antenatal follow-up. Another study conducted in Amhara region West Gojam shows that the leading causes of peri natal death were infection, birth asphyxia, ante partum hemorrhage, hypertensive disorders of pregnancy and obstructed labor. The high prevalence of causes like asphyxia, obstructed labor and infections indicates the limited access to skilled delivery care. In the study area, more than ninety percent of the births took place at home. The extended time the mother spends with obstructed labor before going to health facilities, while attempting home delivery, predisposes the baby to distress leading to asphyxia (42).

CHAPTER SEVEN

CONCLUSION AND RECOMMENDATION

7.1. CONCLUSION

The study has described different variables such as socio demographic factors, maternal and new born related factors during admission and possible cause of birth asphyxia .In conclusion the present study found that the rate of asphyxia in St. Paul hospital Millennium Medical college is 25/1000 live birth and APGAR score of the babies was 174(70.7%) 4- 6, 52(21.1%) 7 - 10 and 20(8.1%) has 0-3 scores. 199(80.6%) babies resuscitated and 219(89%) cried after birth. The previous delivery history of mothers 12(4.9%) premature birth,12 (4.9%) neonatal death, 11(4.5%) intra uterine death and 20(8.1%) intra uterine death. So it is concluded that, strengthening of antenatal screening, perinatal care of new born and interventions of babies born with birth asphyxia is essential.

7.2. RECOMMENDATION

- ✓ The study may be repeated by collecting last 3-5 year data's in different settings.
- ✓ A quasi experimental study can be done to assess the knowledge of mothers regarding birth asphyxia.
- ✓ This study can be elaborated by associated factors of birth asphyxia in SPMMC
- ✓ A comparative study can be done between rural and urban hospital set up.

7.3. STRENGTH AND WEAKNESS OF THE STUDY

- ✓ This study utilized convenience sampling to obtain the required samples. It is relatively easy to get a sample, as the documents are readily available and inexpensive compare to other techniques.
- ✓ The survey involved the whole study population, which allowed for greater precision as compared to taking a sample of the population of interest.
- ✓ The study has no response bias and generated the accumulated data and hopefully contributed knowledge to the birth asphyxia. The weakness of the study is some variables of interest has been Missed. Even though the chart was legible for the study.

7.4. STUDY LIMITATION

- ✓ The objective on the risk factors associated with asphyxia depended largely on the accurate recording of the mother's pregnancy history at the antenatal clinic and also during admission. Some of these entries in the mother's antenatal cards were missing, while some vital observations had not been carried out.
- ✓ This study was conducted in a single hospital and hence result cannot be extrapolated to the entire population.
- ✓ Since it is a retrospective study, no causal relationship can be established from this study.
- ✓ The data was collected only on selected aspects. The tool used for the data collection was developed for the purpose of the study. Hence the tool was not standardized.

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ANNEX I :

INFORM CONSENT

We are graduate class student at SPHMMC, department of Nursing in neonatal nursing specialty program. Now we are conducting our thesis on “ **A study to assess the rate and its associated factors in development of neonatal asphyxia among neonates delivered in SPHMMC, Addis Ababa from April 2016- March 2017** ” by using secondary data. The objective of the study is to assess the rate and its associated factors in development of neonatal asphyxia among neonates delivered in SPHMMC Addis Ababa from April 2016 to March 2017.

We ensure confidentiality by protecting the medical records that could identify study participants. The individual identifiers will be removed and not to be presented at all. Privacy and confidentiality rules in accordance with the applicable regulatory requirements are all respected during the data collection through the presentation of the finding. The data collection would be done tentatively in the month of June-July 2017 for two months. We shall be grateful if you kindly consider this application and do the needful.

Name

Signature

1, -----

2, -----

3, -----

Qualification

Date.....

With regards,

ANNEX-II

CHECK LIST

CHECK LIST TO ASSESS RATE AND ITS ASSOCIATED FACTORS IN DEVELOPMENT OF BIRTH ASPHYXIA AMONG NEONATES DELIVERED IN SPHMMC, ADDIS ABEBA FROM APRIL 2016-MARCH 2017.

A. SOCIO DEMOGRAPHIC CHARACTERISTICS RELATED TO FAMILY AND MOTHER

1. Age of the mother

A. 15-20 years

B. 21-25 years

C. 26-30 years

D. 31-35 years

E. 36-40 years

2. Maternal educational status

A. No formal education

B. Primary

C. Secondary

D. Higher education

3. Residential area of mother

A. Rural

B. Urban

4. Religion of the mother

A. Orthodox

B. Muslim

C. Protestant

D. Catholic

E. Other

5. Occupation of the mother

A. House wife

B. Private

C. Government

D. Other

B. MATERNAL AND NEW BORN RELATED FACTORS

1. Mode of delivery

A. Spontaneous vaginal delivery

B. Vacuum delivery

C. Forceps delivery

D. Cesarean section

2. Duration of labor

A. 6 to 18 hours

B. >18 hour

3. Duration of rupture of membrane

A. Premature rupture of membrane

B. Intrapartum ruptures of membrane

4. Maternal illness

A. Hypertension

B. Diabetes mellitus

C. No medical illness

D. Other

5. Mother previous medical history

A. Premature birth

B. Neonatal birth

C. Intra uterine growth retardation

D. Abortion

E. No Labor history

6. Ante natal follow up

A. Yes

B. No

7. Gestational age of the new born

A. 37 weeks and above

B. 32-37 weeks

C. 28-32 weeks

D. Less than 28 weeks

8. Birth weight of the newborn

A. Less than 1000gm

B. 1000gm-1499gm

C. 1500gm-2499gm

D. 2500gm-3999gm

E. 4000gm and above

9. Sex of the baby

A. Male

B. Female

C. CLINICAL PICTURE OF NEW BORN

1. APGAR score

A. 0-3 score

B. 4-6 score

C. 7-10 score

2. Baby resuscitated at birth

A. Yes

B. No

3. Did baby cried after birth?

A. Yes

B. No